



# Loop-IP6810 Self-Healing Ring Network Termination Unit

## Description

The Loop-IP6810 is a self-healing ring network termination unit (NTU) with a built-in L2 switch. It can be desktop, wall or DIN Rail mounted. LEAPS, RSTP, or MSTP\* Ethernet Ring protection or point-to-point protection is facilitated in 100 Base-FX.

All end equipments can be either in packet format via Ethernet ports or serial data via RS232/485 interfaces which will be converted into packet format within IP6810. The IP6810 has two WAN optical interfaces, two RS232/485 DTE interfaces, three Ethernet LAN interfaces, two sets of dry contact IN/OUT interfaces, and one alarm relay connector. The IP6810 has a hardening option which will support -20°C to 70°C.

The IP6810 supports auto-discovery to discover all units on the ring, and also supports remote-configure for the ease of installations.

The IP6810 supports single AC, single DC or dual DC to field requirement. PoE option is also available.

The IP6810 facilitates automation systems, SCADA systems, surveillance systems, traffic control systems, transportation systems and IP networking with robust protection in ring, point-to-point, or Omni-bus-like topology. Easy installation and configuration also make maintenance or further expansion more efficient and cost-effective.

\* Future Option

## Features

- Full front access (ETSI) unit comply with IP30 standard
- Desktop, wall, or DIN Rail mounting
- Compact intelligent FX packet optical ring with layer-2 switch capability
- WAN port with OA&M function
  - Dual optical Fast Ethernet interfaces or
  - Dual SFP optical housing interfaces
- Tributary ports
  - 3 ports 10/100 BaseT Ethernet (with PoE option available in DC 48 only)
  - 2 ports RS232/485 Interfaces, user selectable via 2-port DIP switch
  - 2 Dry-Contact for input and 2 Dry-Contact for output; support point-to-point and point to multi-point
- Power modules
  - On-board fixed single AC supply
  - On-board fixed single/dual DC modules with dual feed
- Auto-discovery topology, auto-diagnostic and remote-configure for easy plug-and-install (up to 64 units)
- Ethernet Function:
  - LEAPS
  - IEEE 802.1w RSTP, 802.1s MSTP\*
  - IEEE 802.3x Flow Control, 802.1q Port Base VLAN/ Port Isolation
- Up to 1024 MAC address
- High speed, asynchronous RS232/RS485 for point-to-point, point to multi-point, or Omni-bus-like applications
- Master/Slave units setting by using DIP switch
- Auto-negotiating or forced speed for speed and Full/Half Duplex for Ethernet ports
- Full/Half Duplex for tributary Ethernet ports
- Alarm Relay and ACO (Alarm Cutoff) button
- Remote firmware download via TFTP & Z modem
- Remote configuration upload & download via TFTP
- Management port and interface
  - In-band management
  - RS232 console via DB9 connector
  - SNMP v1, v2, v3
  - SSH v2
  - Telnet
  - LoopView GUI EMS
- RoHS Compliance

\*Future Option






## Ordering Information

To specify options, choose from the list below.

**Note:** RoHS compliant units are identified by the letter **G** appearing immediately at the end of the ordering code.

Model	Description	Note
<b>Main Unit</b>		
Loop-IP6810-CS-SFPC -ipp1-ipp2-add1 <b>-G</b>	Self-healing NTU Device with dual SFP(mini-GBIC) optical housing daughter card for WAN port (SFP optical module not included). Temperature range 0°C to 50°C (Available in Phase 2)	- Where wan1, wan2, pp1, pp2, ipp1, ipp2, add1, and SFP modules are defined in the tables below.
Loop-IP6810-IS-SFPC -ipp1-ipp2-add1 <b>-G</b>	Self-healing NTU Device with dual SFP(mini-GBIC) optical housing daughter card for WAN port (SFP optical module not included). Temperature hardening optional range -20°C to 70°C	- Add1 only available on DC48 option.

### Accessories

<b>Software</b>		
Loop-IP6810-UPGR-LEAPS	Activation code for LEAPS function	
<b>Power Cord</b>		
Loop-ACC-PC-USA	AC power cord for Taiwan/America	
Loop-ACC-PC-EU	AC power cord for Europe	
Loop-ACC-PC-UK	AC power cord for UK	
Loop-ACC-PC-AUS	AC power cord for Australia	
Loop-ACC-PC-CH	AC power cord for China	
<b>Tray</b>		
81.TRAY19.0000G	19" Tray (One tray for two base units)	
<b>User's Manual</b>		
Loop-IP6810-S-UM	User's Manual (optional, paper copy). A CD version of the manual is already included as standard equipment.	

### ■ SFP Optical Module (temperature range from 0°C to 50°C) Tables for Fast Ethernet (Available in Phase 2)

<b>SFP 155 Mbps (mini GBIC) Dual Fiber</b>	<b>MHBTW</b>	Multi mode optical module with dual uni-directional fiber, 155M, 1310nm, 2Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	<ul style="list-style-type: none"> <li>• Temperature ranges from 0°C to 50°C</li> <li>• Use 2 fibers for all SFP optical modules.</li> </ul>
	<b>PHB2W</b>	Single mode optical module with dual uni-directional fiber, 155M, 1310nm, 15~20Km, LC connector w/o DDM, S-1.1/IR1	
	<b>PHB3W</b>	Single mode optical module with dual uni-directional fiber, 155M, 1310nm, 30Km, LC connector w/o DDM, S-1.1/IR1/Fast Ethernet	
	<b>PHB5W</b>	Single mode optical module with dual uni-directional fiber, 155M, 1310nm, 50Km, LC connector w/o DDM, L-1.1/LR1/Fast Ethernet	
	<b>PHC8W</b>	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 80Km, LC connector w/o DDM, L-1.2/LR2	
	<b>PHCUW</b>	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 100Km, LC connector w/o DDM, L-1.2/LR2Fast Ethernet	
	<b>PHCXW</b>	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 120Km, LC connector w/o DDM, L-1.2 extended distance	
	<b>PHB3D</b>	Single mode optical module with dual uni-directional fiber, 155M, 1310nm, 30Km, LC connector with DDM, S-1.1/IR1/Fast Ethernet	
	<b>PHB5D</b>	Single mode optical module with dual uni-directional fiber, 155M, 1310nm, 50Km, LC connector with DDM, L-1.1/LR1/Fast Ethernet	
	<b>PHC8D</b>	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 80Km, LC connector with DDM, L-1.2/LR2	
	<b>PHCUD</b>	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 100Km, LC connector with DDM, L-1.2/LR2/Fast Ethernet	
	<b>PHCXD</b>	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 120Km, LC connector with DDM, L-1.2 extended distance	

■ **SFP Optical Module (temperature range from -40°C to 85°C) Plug-in Tables for Fast Ethernet**

<b>SFP 155 Mbps (mini GBIC) Dual Fiber</b>	<b>MHTTW</b>	Multi mode optical module with dual uni-directional fiber, 155Mbps, 1310nm, 2Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	<ul style="list-style-type: none"> <li>• Temperature ranges from -40°C to 85°C</li> <li>• Use 2 fibers for all SFP optical modules</li> </ul>
	<b>PHT3W</b>	Single mode optical module with dual uni-directional fiber, 155Mbps, 1310nm, 30Km, LC connector w/o DDM, S-1.1/IR1	
	<b>PHT6W</b>	Single mode optical module with dual uni-directional fiber, 155Mbps, 1310nm, 60Km, LC connector w/o DDM, L-1.1/LR1	

**NOTE:** For other special optical modules, please contact your nearest Loop sales representative.

■ Where **ipp1** is used to select the 1<sup>st</sup> industrial power supply (temperature hardening optional range -20°C to 70°C):

<b>ipp1 =</b>	<b>Description</b>	<b>Note</b>
<b>IAC</b>	Single AC power supply (100 to 240 Vac, 50/60 Hz)	<ul style="list-style-type: none"> <li>• Please choose appropriate power cord for AC version.</li> <li>• It would not support power redundancy.</li> <li>• For redundancy purposes, ordering a second power module will provide dual DC power.</li> </ul>
<b>IDC24</b>	Single DC power supply (-24 Vdc: -18 to -36 Vdc)	
<b>IDC48</b>	Single DC power supply (-48 Vdc: -36 to -72 Vdc)	

■ Where **ipp2** is used to select the 2<sup>nd</sup> DC power supply for **pp1** (temperature hardening optional range -20°C to 70°C) :

<b>ipp2 =</b>	<b>Description</b>	<b>Note</b>
<b>IDC24</b>	Single DC power supply (-24 Vdc: -18 to -36 Vdc)	It is applicable to IDC24 in <b>ipp1</b> only.
<b>IDC48</b>	Single DC power supply (-48 Vdc: -36 to -72 Vdc)	It is applicable to IDC48 in <b>ipp1</b> only.

**NOTE:** Your selection for pp2 must be the same as pp1.

■ Where **add1** is used to select enclosure types:

<b>Add1 =</b>	<b>Description</b>	<b>Note</b>
<b>PoE</b>	Power over Ethernet	Only available on DC48 option only

**Examples 1:**

Main unit: Loop-IP6810-IS-SFPC-IDC24-IDC24-G

Description: Industrial standard unit with 2 SFP optical housing daughter card, two -24 Vdc industrial power modules.

**Examples 2:**

Main unit: Loop-IP6810-CS-SFPC-IAC-G (Phase 2)

Description: Commercial standard unit with 2 SFP optical housing daughter card, one 100 to 240 Vac industrial power module.

**Examples 3:**

Main unit: Loop-IP6810-IS-SFPC-IDC48-IDC48-PoE-G

Description: Industrial standard unit with 2 SFP optical housing daughter card, two-48 Vdc industrial power modules, and PoE option.

## **Loop-IP6810 RTU Ethernet Ring -Standalone Product Specification**

### **WAN-Network Side Interface**

Number of Ports Up to 2

#### **Aggregate Lines - SFP Optical Module Characteristics(Commercial Standard, 155Mbps Max. Available in Phase 2)**

SFP Optical Module	Direction	Wavelength (nm)	Connector	Distance (km)
MHBTW	Dual uni-directional fiber	1310nm	LC ( without DDM)	2
PHB2W	Dual uni-directional fiber	1310nm	LC ( without DDM)	15~20
PHB3W	Dual uni-directional fiber	1310nm	LC ( without DDM)	30
PHB5W	Dual uni-directional fiber	1310nm	LC ( without DDM)	50
PHC8W	Dual uni-directional fiber	1550nm	LC ( without DDM)	80
PHCUW	Dual uni-directional fiber	1550nm	LC ( without DDM)	100
PHCXW	Dual uni-directional fiber	1550nm	LC ( without DDM)	120
PHB3D	Dual uni-directional fiber	1310nm	LC ( with DDM)	30
PHB5D	Dual uni-directional fiber	1310nm	LC ( with DDM)	50
PHB8D	Dual uni-directional fiber	1550nm	LC ( with DDM)	80
PHCUD	Dual uni-directional fiber	1550nm	LC ( with DDM)	100
PHCXD	Dual uni-directional fiber	1550nm	LC ( with DDM)	120

**Note:** For industrial standard please contact your nearest Loop sales representative.

#### **Aggregate Lines - SFP Optical Module Characteristics(Industrial Standard, 155Mbps Max.)**

SFP Optical Module	Direction	Wavelength (nm)	Connector	Distance (km)
MHTTW	Dual uni-directional fiber (multi mode)	1310nm	LC ( without DDM)	2
PHT3W	Dual uni-directional fiber	1310nm	LC ( without DDM)	30
PHT6W	Dual uni-directional fiber	1310nm	LC ( without DDM)	60

**Note:** For industrial standard please contact your nearest Loop sales representative.

### **Tributary- Customer Side Interface**

#### **RS232 Interface**

Number of Ports	Up to 2	Note: Interface changed by DIP switch from RS485
Electrical	RS232, DCE	
Baud Rate	200, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps, asynchronous	
Function	Up to 16 remote IP address each port	
	Flow control: RTS/CTS, XON/XOFF	
	RTS forwarding	
Connector	DB9, female	

#### **RS485 Interface**

Number of Ports	Up to 2	Note: Interface changed by DIP switch from RS232
Electrical	RS485, DCE	
Baud Rate	200, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps, asynchronous	
Function		
Connector	DB9, female	

### Ethernet Interface

Number of ports	3
Ethernet functions	100 Base-FX 10/100BaseT, IEEE 802.3, 802.3u LEAPS (Loop Ethernet Automatic Protection Switching) 802.1q Port Base VLAN, Port Isolation 802.3x Flow Control Auto-negotiation (10/100M) Auto MDI/MDIX Full or half duplex Up to 1024 MAC addresses Rate limiting for LAN port
QoS Functions	Four priority queue
Connector	RJ45

### Dry Contact I/O Interface

Connector	DB9, Female
<b>2-channel Inputs</b>	
Internal Resistance	1 K ohm
Activation Current	3.3 mA
Deactivation Current	1.5 mA
Allowable Current	4 mA
<b>2-channel Outputs</b>	
Initial Insulation Resistance	Min. 100M ohm (at 500 Vdc)
Allowable Short-circuit Rating Current	5 mA (at maximum)

### Protocol

IEEE 802.1w RSTP, 802.1s MSTP\*, LEAPS  
SNMP

### Alarm Control

Alarm relay	NO, COM, NC
Connector	Terminal block
Alarm cut off	ACO button

### Management

LEDs	Multi-color LEDs
Console port	Protocol: Menu driven VT-100 Electrical: RS232, DCE Connector: DB9S, female
Telnet	
SSH	v2
SNMP	v1, v2, v3
LoopView GUI EMS	

### Performance Monitor

Alarm Queue	Contains up to 500 alarm records which record the latest alarm type, alarm severity, and date & time
Oa&M	Link Status Update, Link Status Monitoring

### Power

Power	AC: Full range supports 100 to 240 Vac, 50/ 60Hz DC24: -18 to -36 Vdc DC48: -36 to -72 Vdc Both DC24 and DC48 are on-board fixed single/dual DC modules with dual feed
PoE (Power over Ethernet)	DC input range: -44 to -57 Vdc (PSE for indoor only)
Power consumption	10 Watts maximum
Protection	Over current protection fuse

\*Future Option

### Physical and Environmental

Dimensions	215 x 41.5 x 156 mm (WxHxD), 1U height
Temperature range	-20 to 70 °C
Humidity	0 to 95% RH (non-condensing)
Mounting	Desk-top, wall mount , DIN rail
Enclosure Type	IP30 enclosure

### Standard Compliance

IEEE	802.3, 802.3u, 802.3x, 802.1d, 802.1w, 802.1p, 802.1q
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### Certification

EMI/EMC	FCC15 subpart B class A, EN55022 class A, EN55024, EN300 386
Safety	IEC60950-1, EN60950-1

### **Front Panel View:**



***IP6810 (dual 48Vdc with PoE option)***



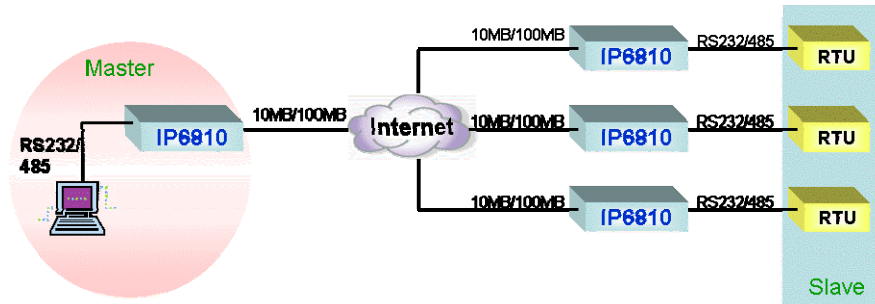
***IP6810 (dual 24Vdc without PoE option)***



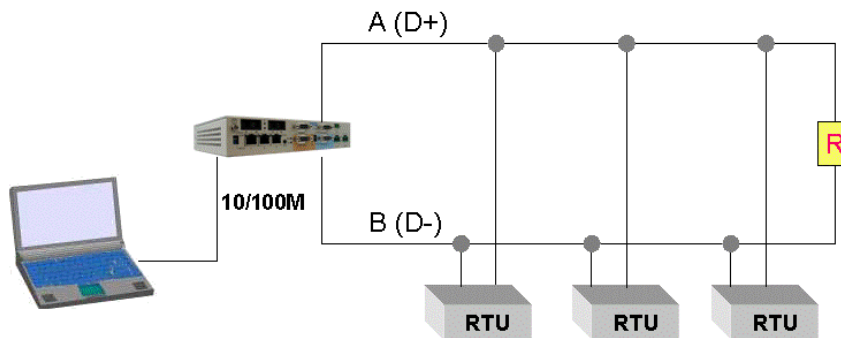
***IP6810 (AC power)***



## Application Illustrations:

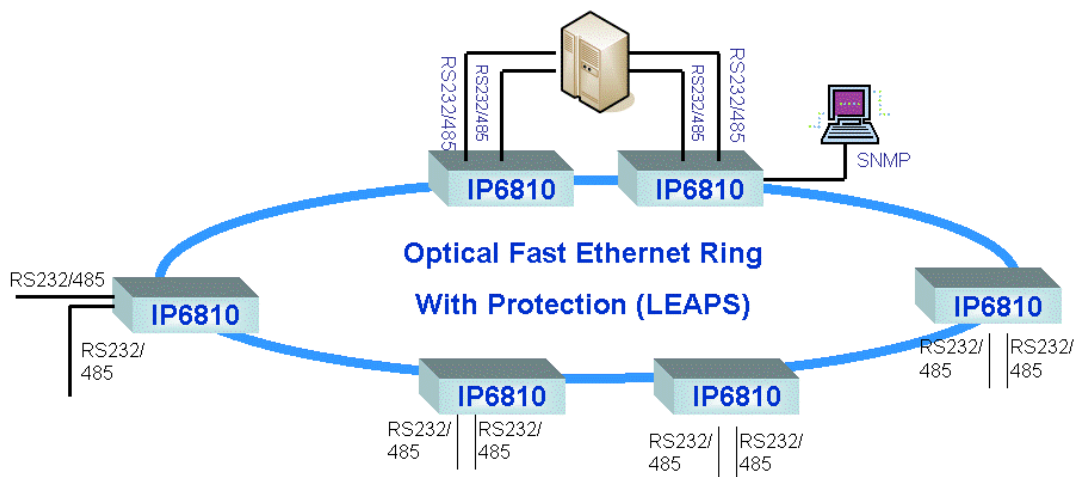


**Point to Multipoint Application**

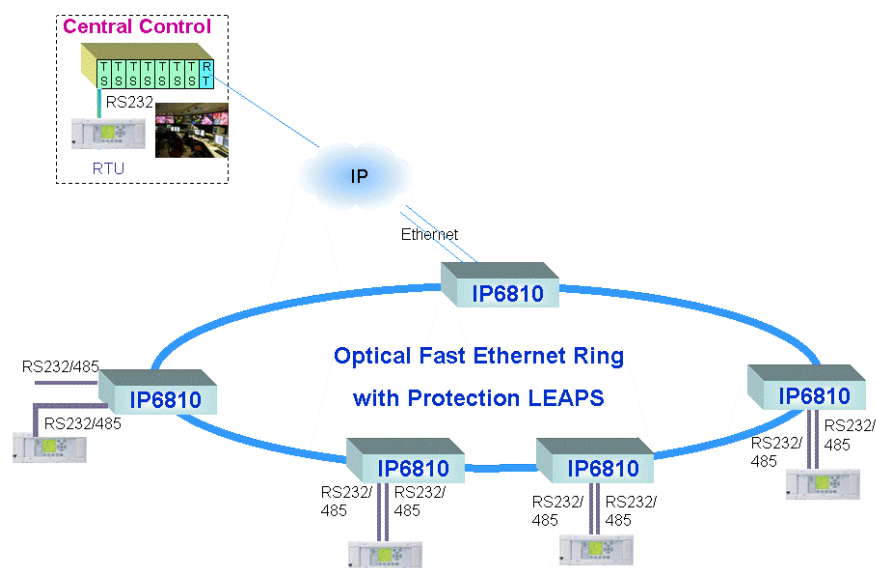
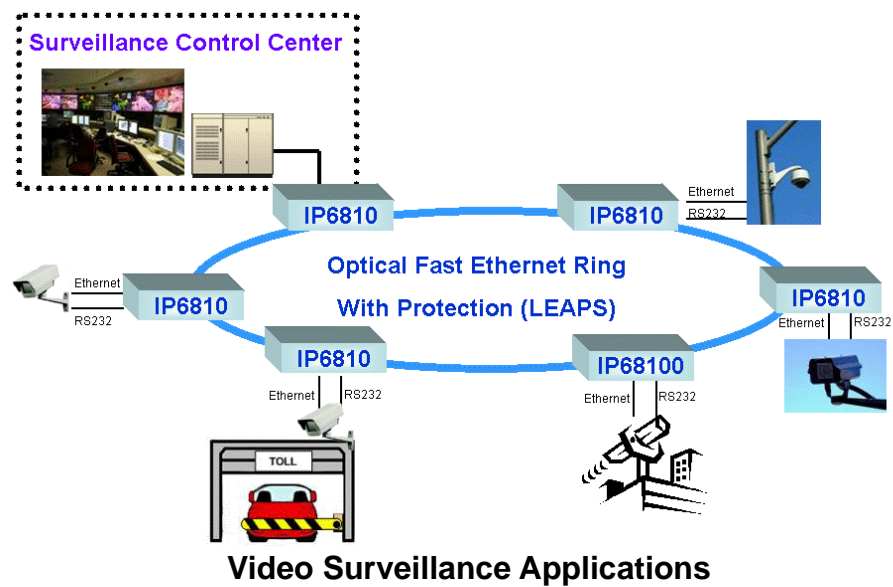
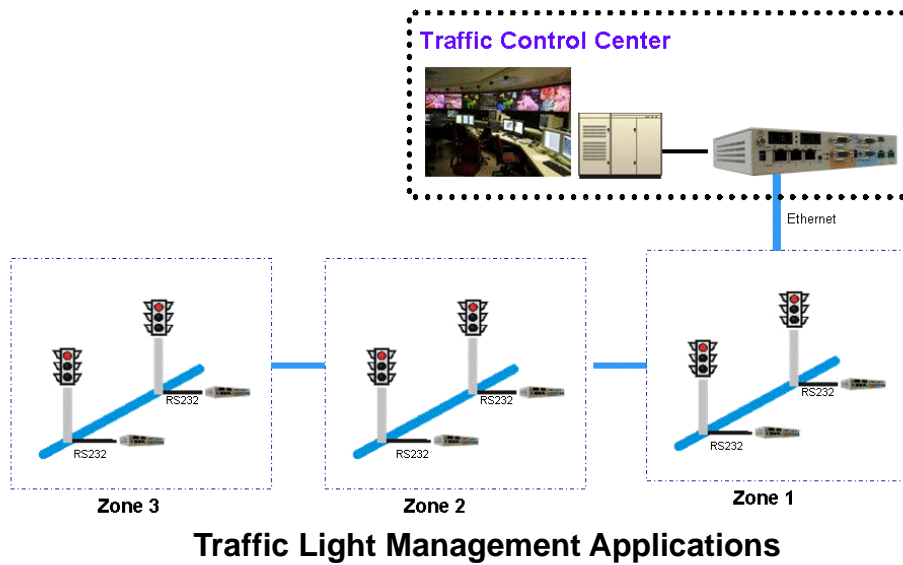


Note that **R** represents a termination resistor, and its value depends on its length.

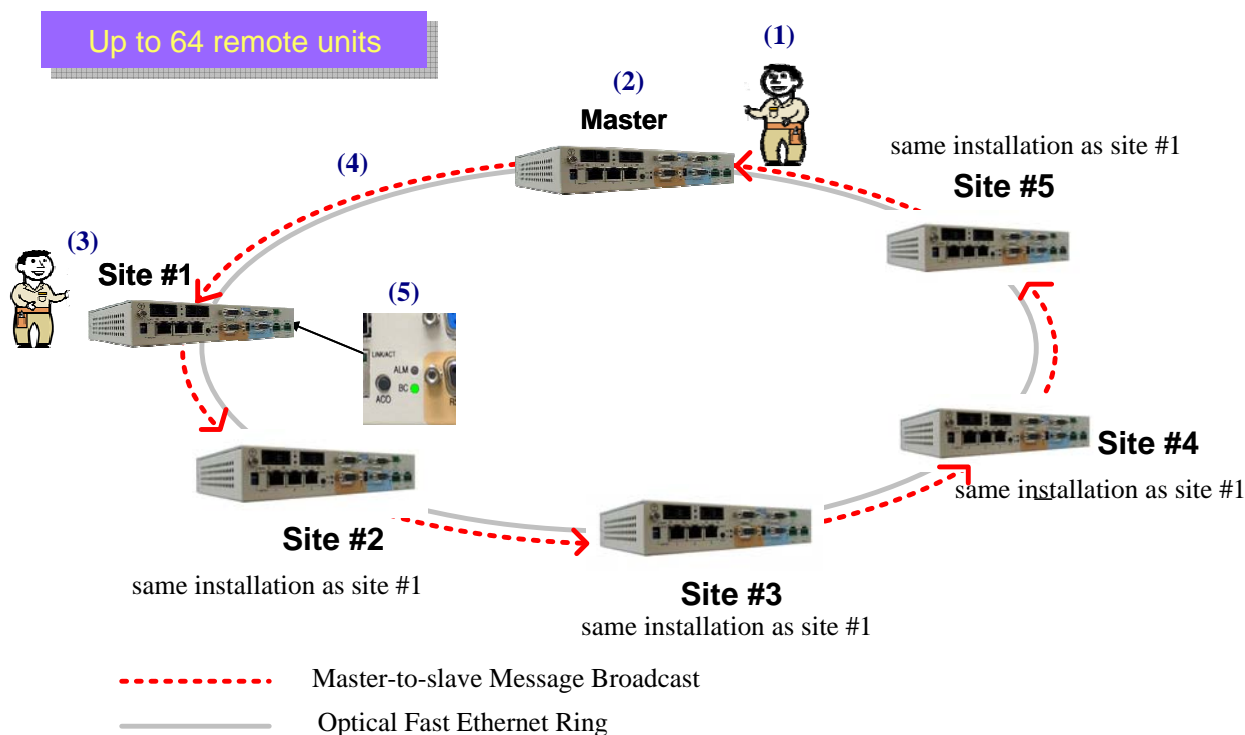
**Half Duplex RS-485 Bus Mode**



**Local SCADA Applications**







## No Configuration Necessary in Advance for Installation

### Setup Procedure:

- (1) Set DIP switch to Master, connect both WAN ports and power up the unit
- (2) On VT100, set the master unit's Auto-Discovery function to ENABLE
- (3) On remote site, set the unit's DIP switch to Slave, connect both WAN ports and power up the unit
- (4) The master unit will automatically detect the slave unit and show the information on VT100 screen
- (5) BC LED will turn GREEN, which indicates the Link between Master and Site 1 is ON

### Auto-Configure (Plug-and-Play) Application



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**ISO 9001/ISO 14001**

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